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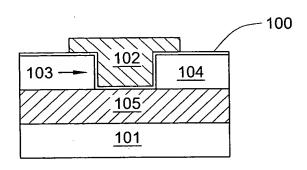


FIG. 1

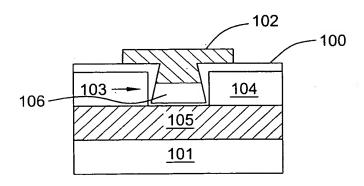


FIG. 2

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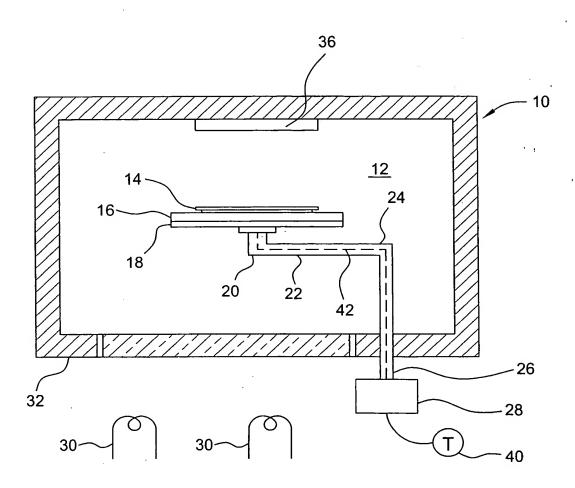
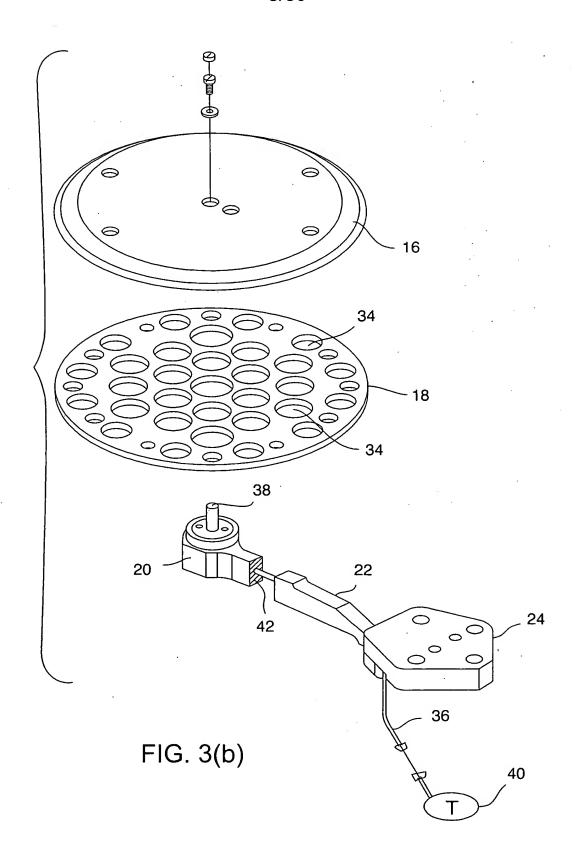


FIG. 3(a)

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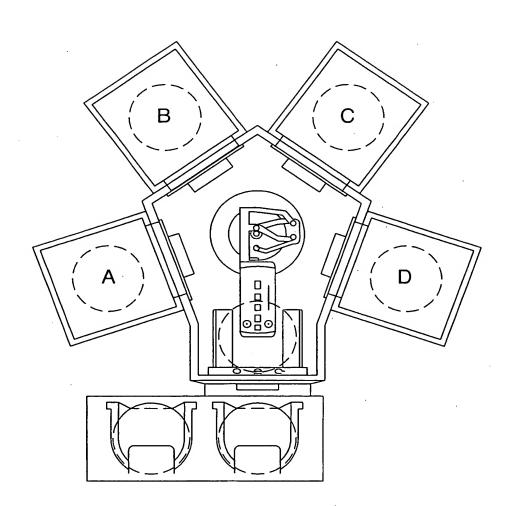
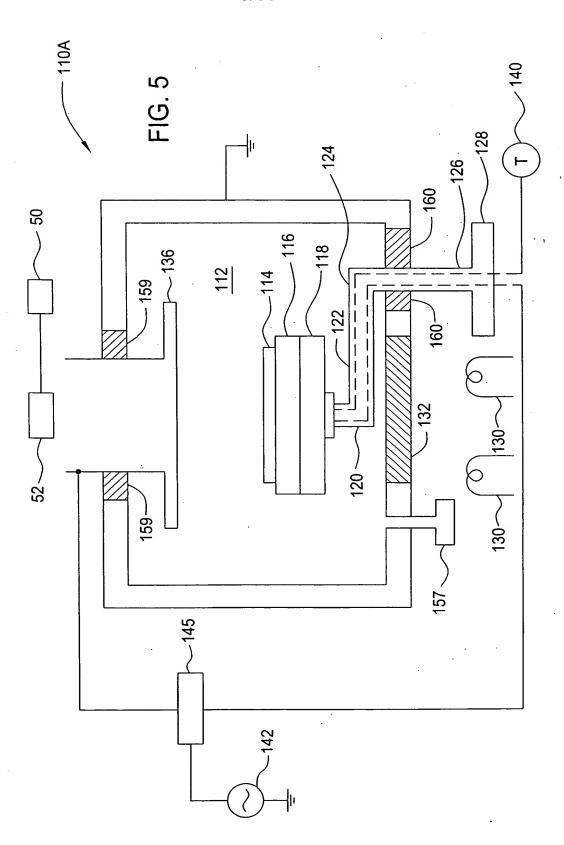


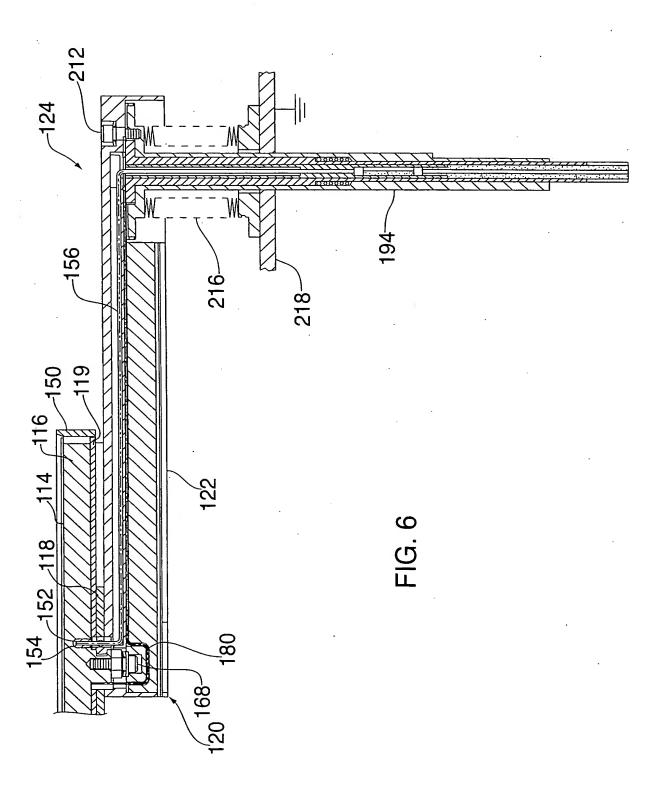
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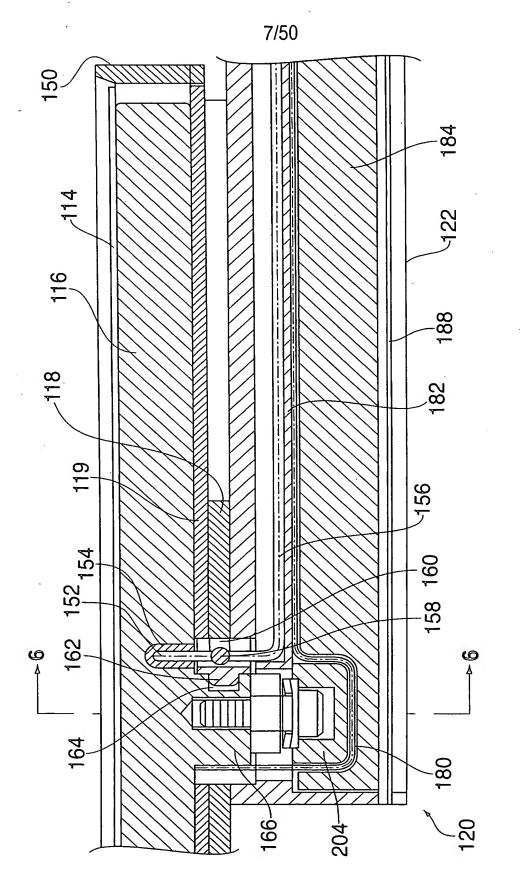
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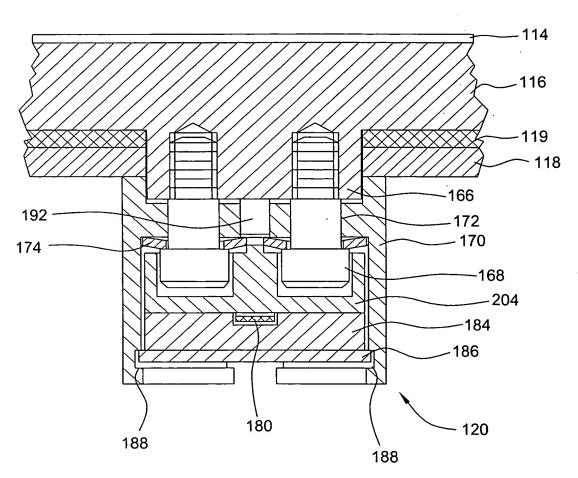
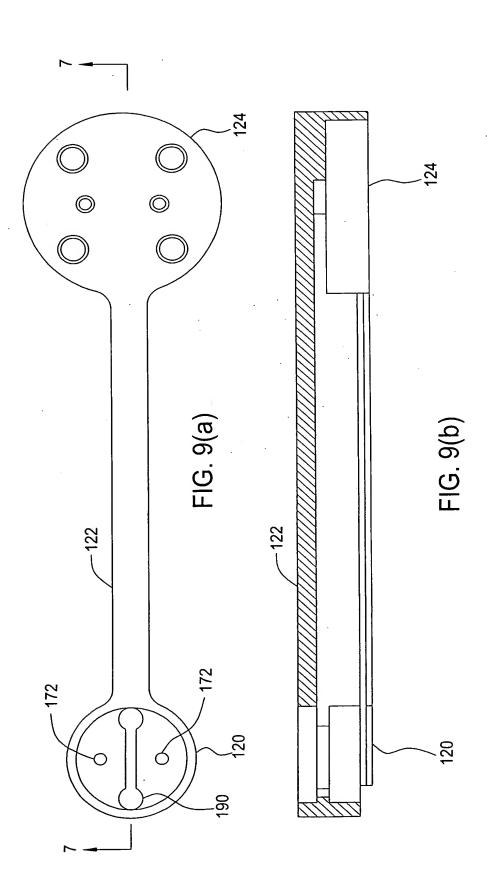


FIG. 8

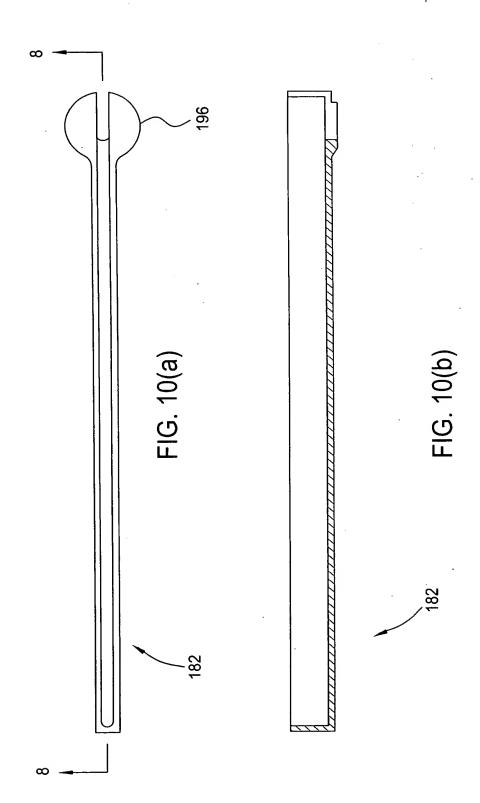
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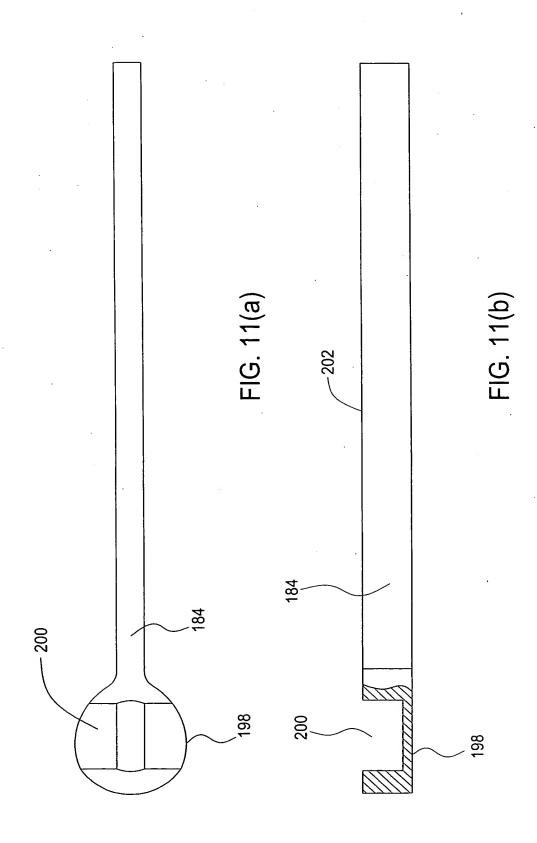
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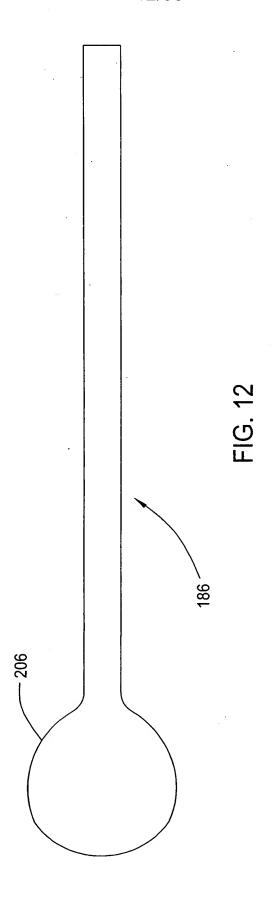
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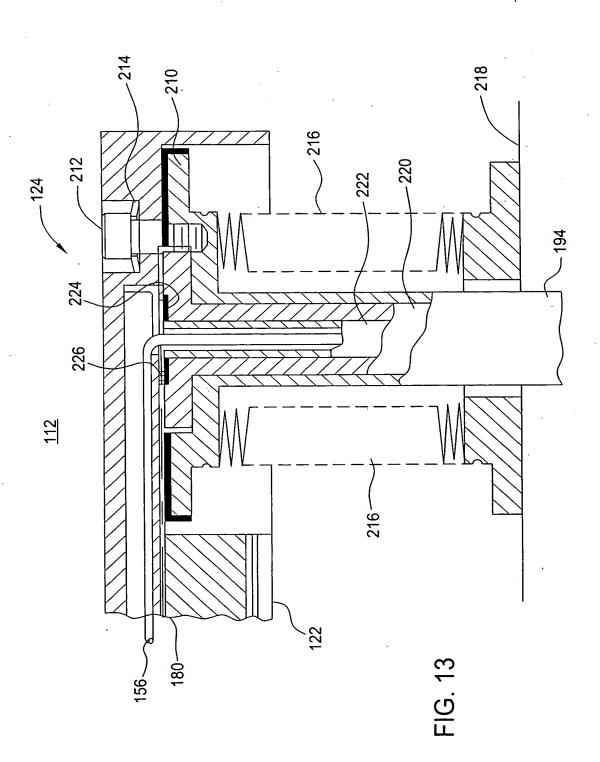
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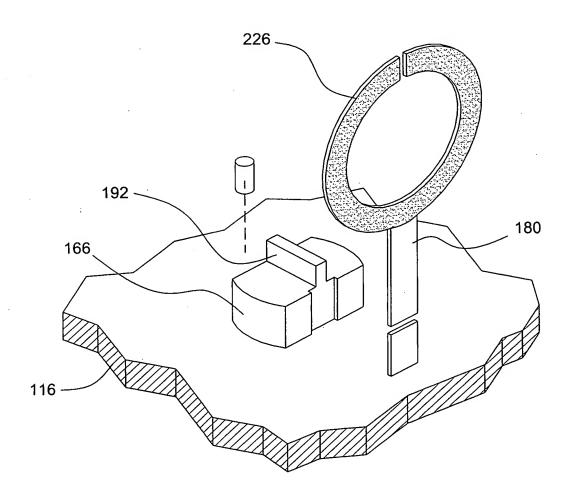


FIG. 14

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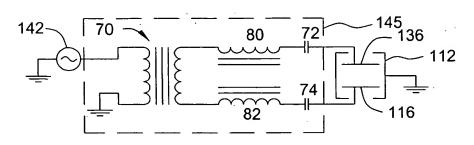


FIG. 15(a)

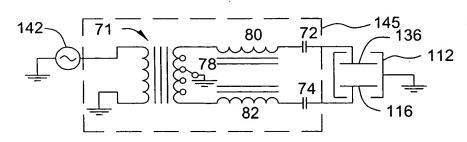


FIG. 15(b)

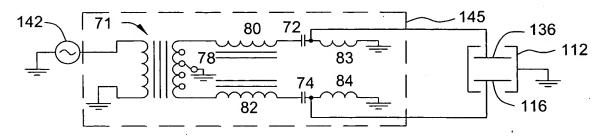
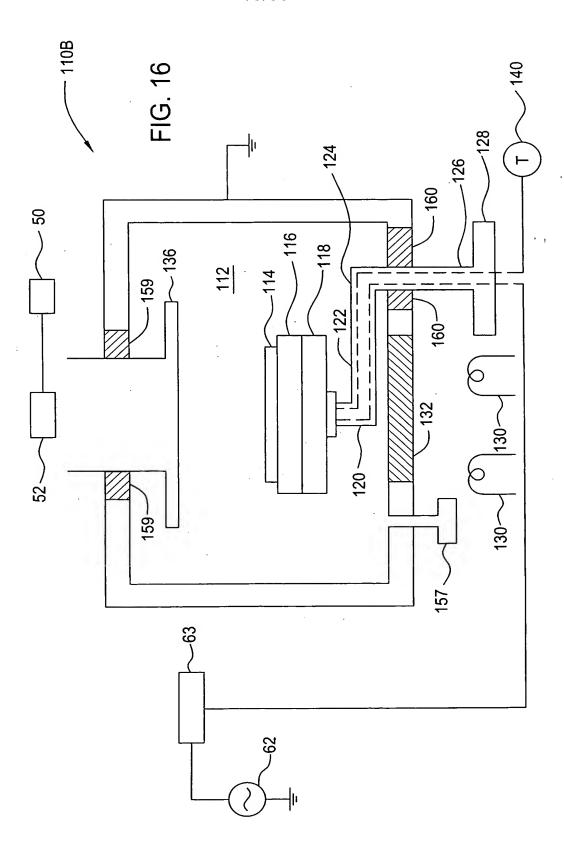


FIG. 15(c)

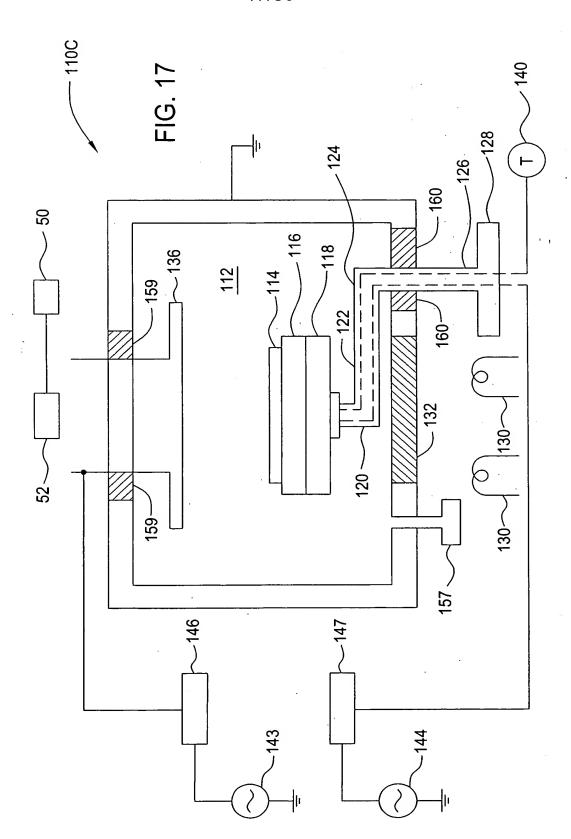
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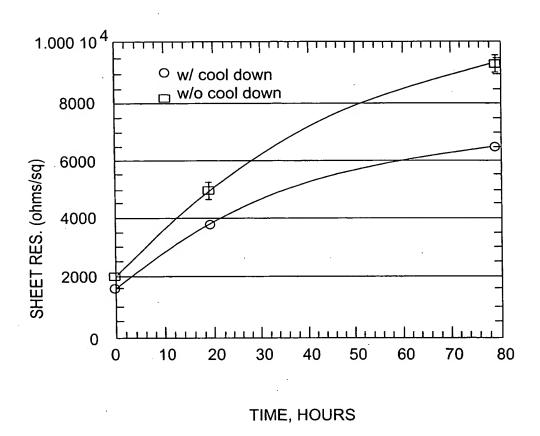
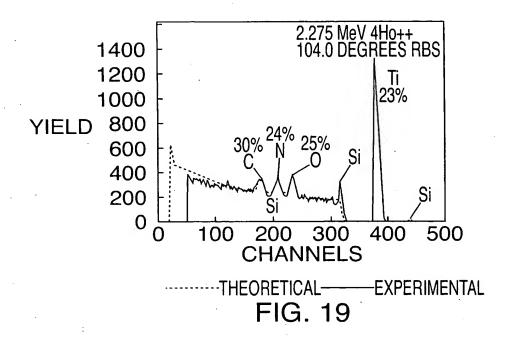


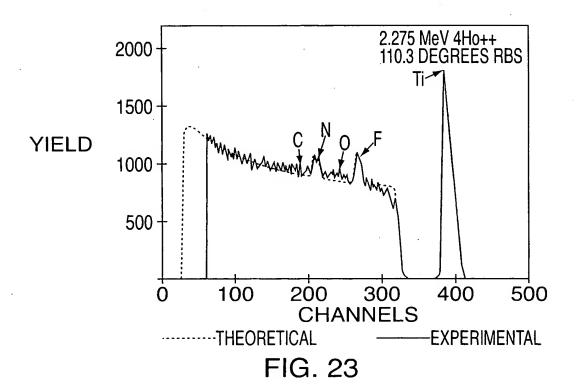
FIG. 18

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		· 1	 T				
	RESISTIVITY,μΩ-cm		16,000	81,200	2,200	1×10 ⁶	39,500
LE I	THICKNESS, Å		~200	~200	~200	~400	~500
TABLE	DESCRIPTION			H ₂ ADDED	NF ₃ ADDED	H ₂ /NF ₃ ADDED	MIXED H ₂ N ₂ ADDED
	EXAMPLE		CONTROL	C1	C2	ညေ	C4

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	— т	 		
	RESISTIVITY, $\mu\Omega$ -cm	13,500	15,500	16,500
E II	THICKNESS, Å	~200	~500	~500
TABLE II	DESCRIPTION	H ₂ PLASMA PRE/POST	N ₂ PLASMA PRE/POST	NF ₃ FLOW PRIOR TO DEPOSITION
	SAMPLE	C5	90	<i>C</i> 7

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	<u> </u>		I						T T	Т	
	PERCENT CHANGE		130	43	26	31	39	19	11	4	2
	μΩ -cm	24 HOURS	25,385	6,623	3,623	2,662	3,827	2,549	1,915	1,203	933
	RESISTIVITY, µΩ-cm	INITIAL	11,020	4,620	2,870	2,027	2.762	2,150	1,630	1,154	913
	TIME, THICKNESS, Å		226	181	202	654	629	604	909	376	220
TABLE III	TIME, SEC			30	30	30	09	09	09	30	30
	POWER, WATTS		•••	100	100	100	100	100	100	100	100
	THICKNESS PER ÇYCLE, A		100	200	333	250	200	333	550	100	. 50
	NUMBER OF CYCLES		G	. 2	3	4	2.	3	4	5	5
	SAMPLE		CONTROL	EX. 1	EX.2	EX.3	EX. 4	EX. 5	EX.6	EX. 7	EX. 8

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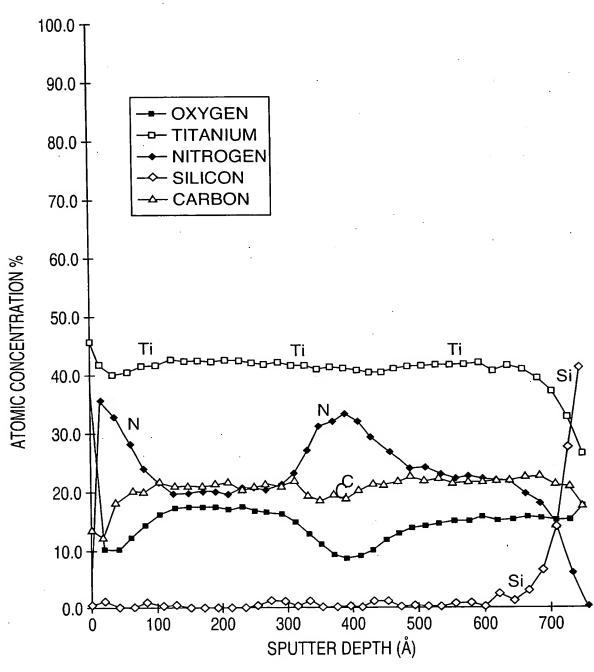
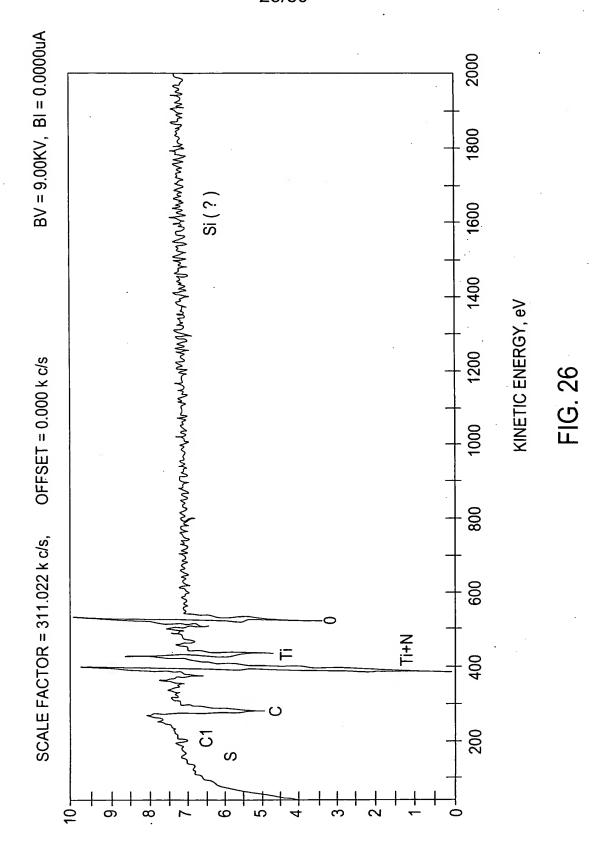


FIG. 24

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	%, O		18.1	20.9	18.6	21.9
E IV	N ₂ ,%		32.4	20.0	32.6	22.8
TABLE IV	%**0	٠	8.6	17.2	8.2	14.3
	ОЕРТН, Å		42	188	397	543

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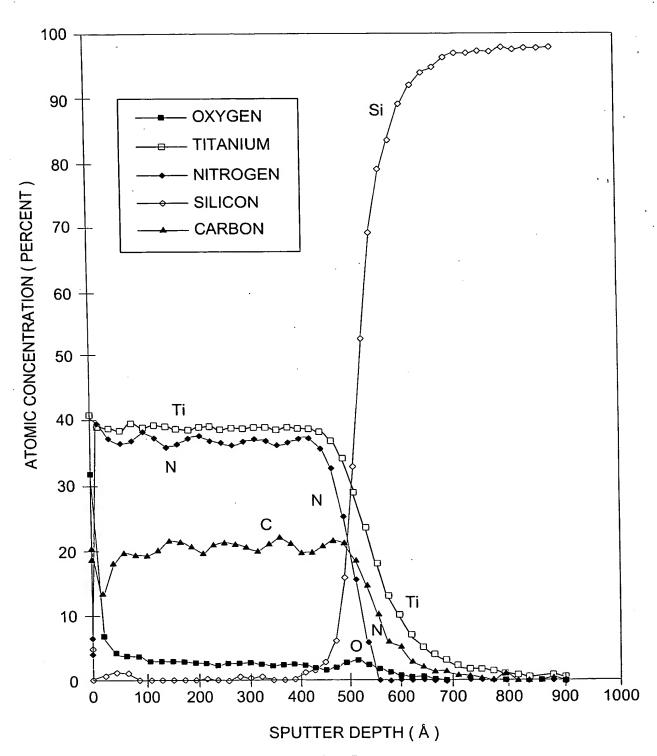
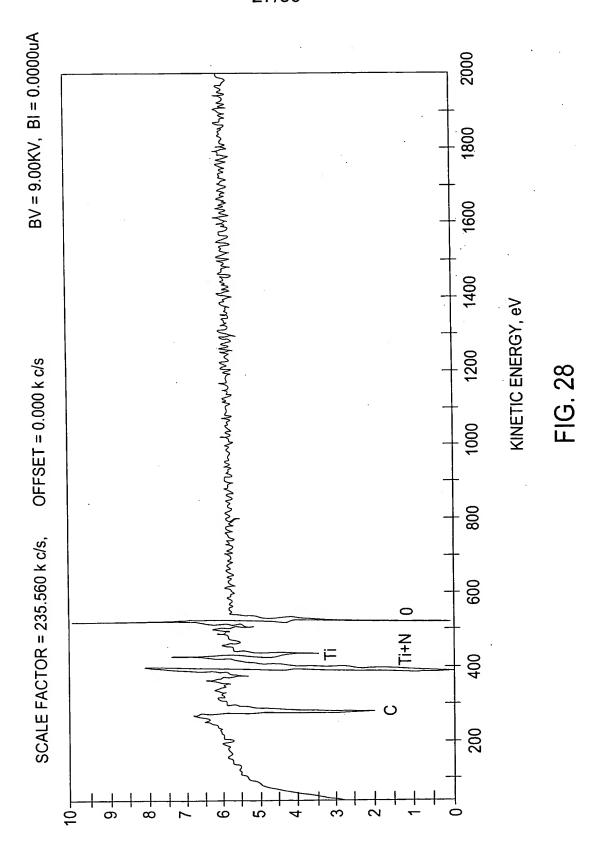


FIG. 27

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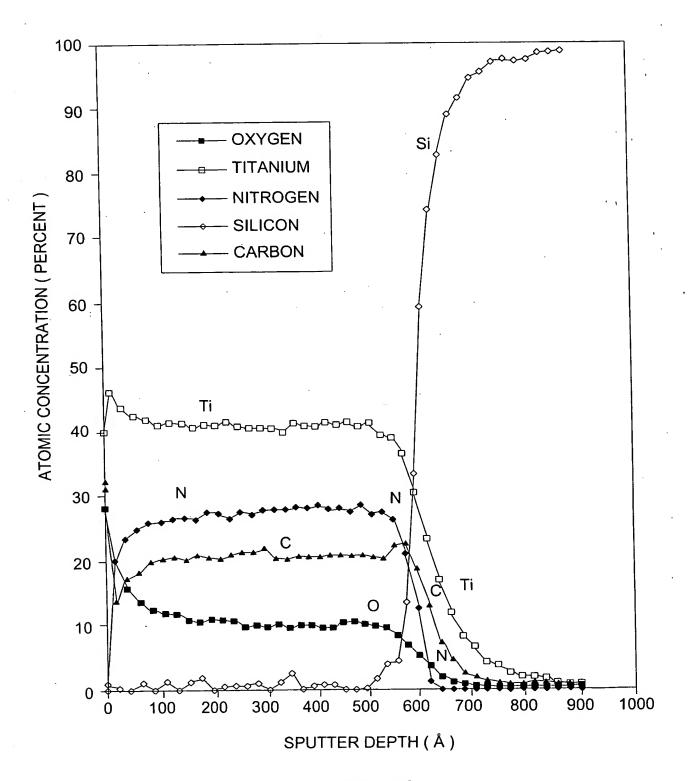
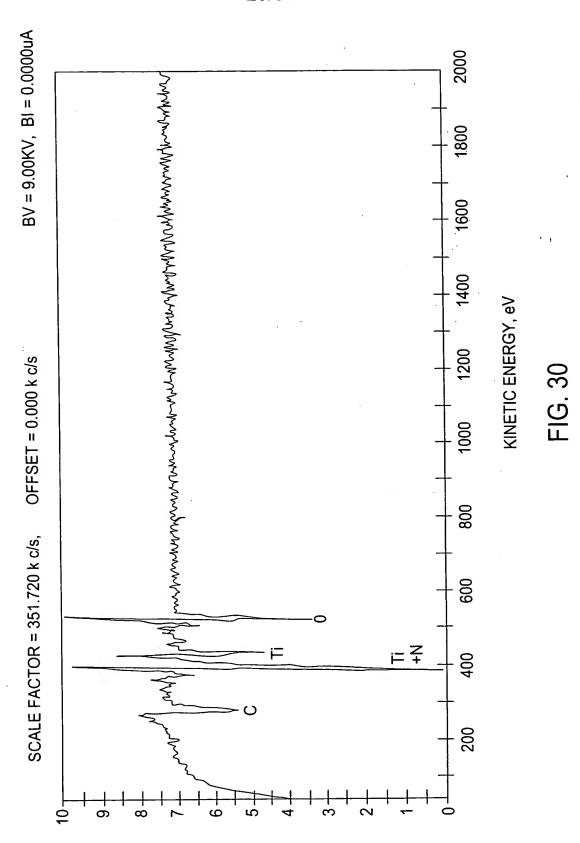


FIG. 29

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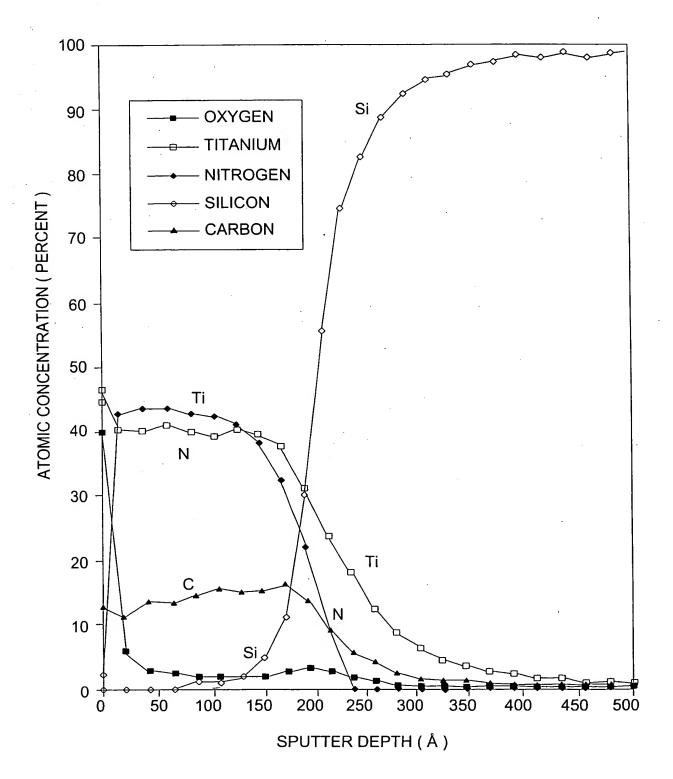
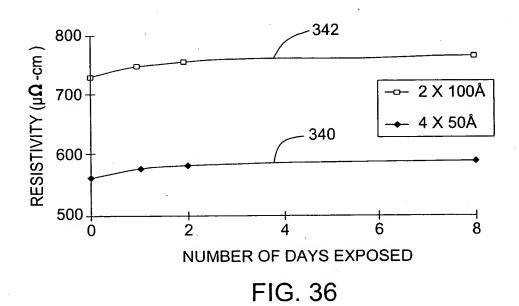


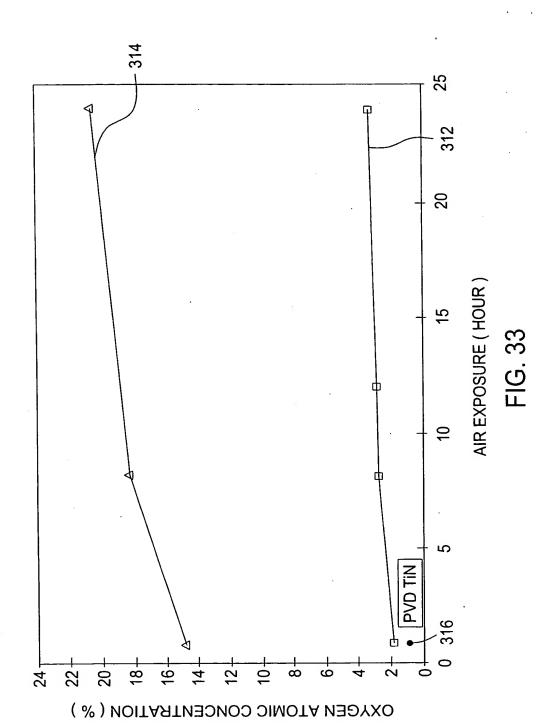
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TABLE V				
CONTROL 3.48 x 10 ²² cm ⁻³				
EXAMPLE 7	3.96 x 10 ²² cm ⁻³			
EXAMPLE 8	$3.94 \times 10^{22} \text{ cm}^{-3}$			

FIG. 32

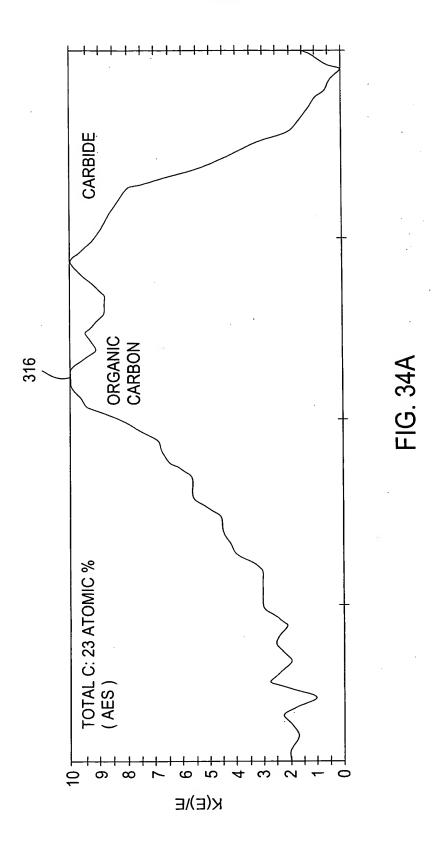




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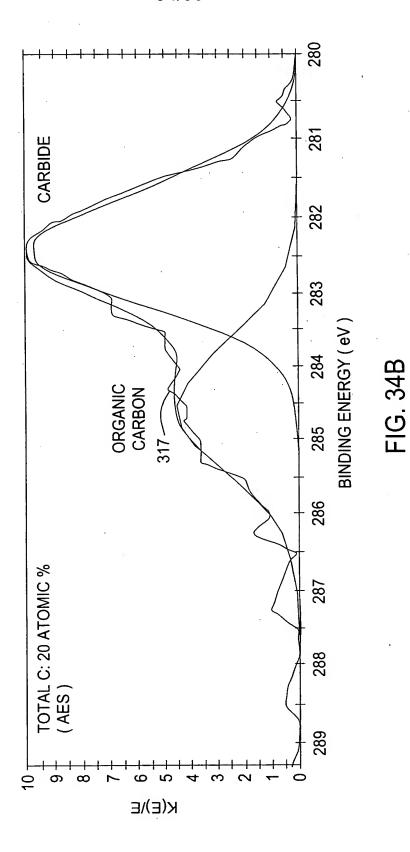
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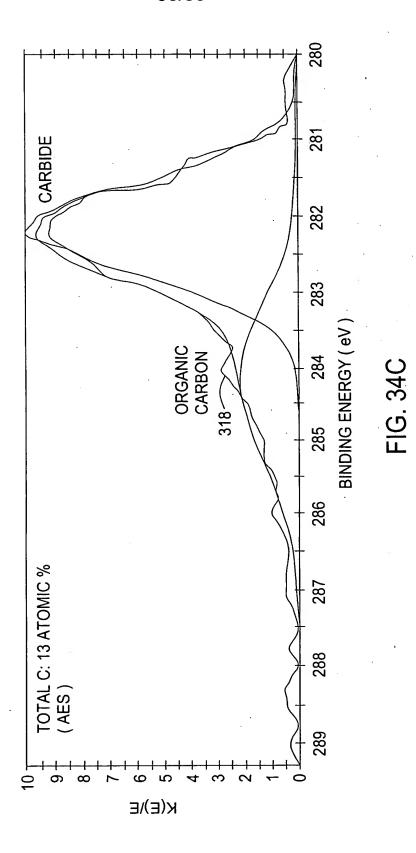
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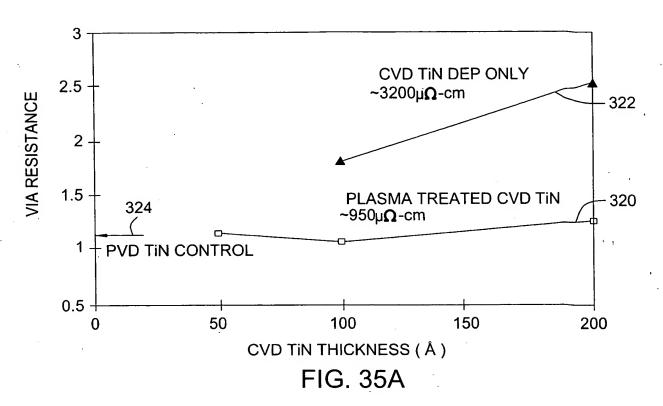
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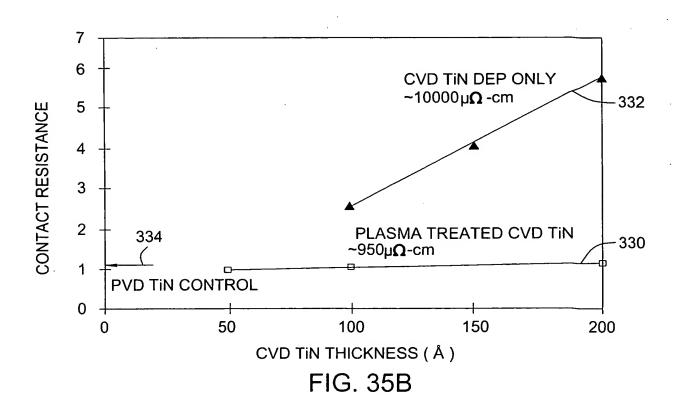


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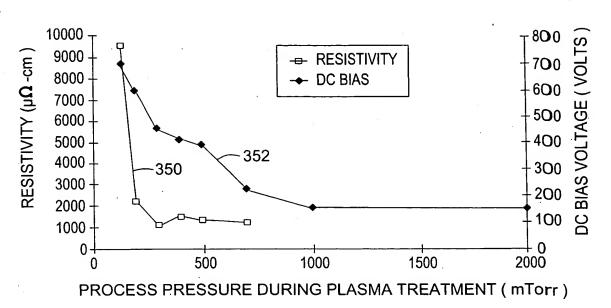


FIG. 37

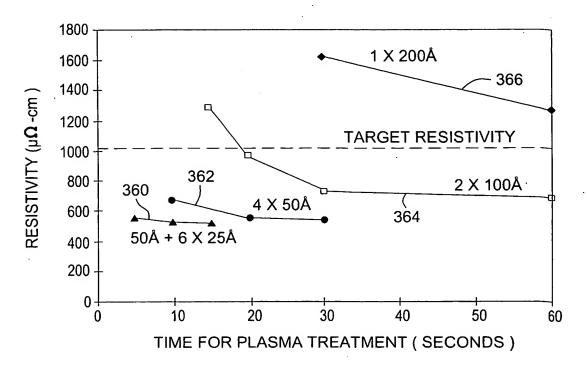
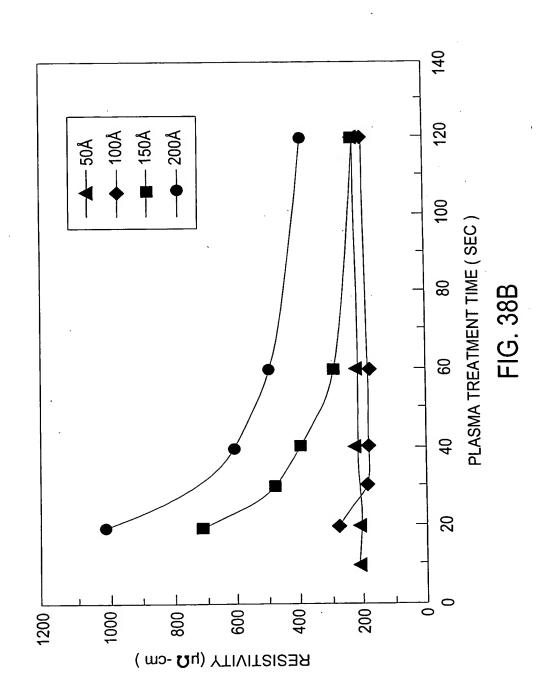


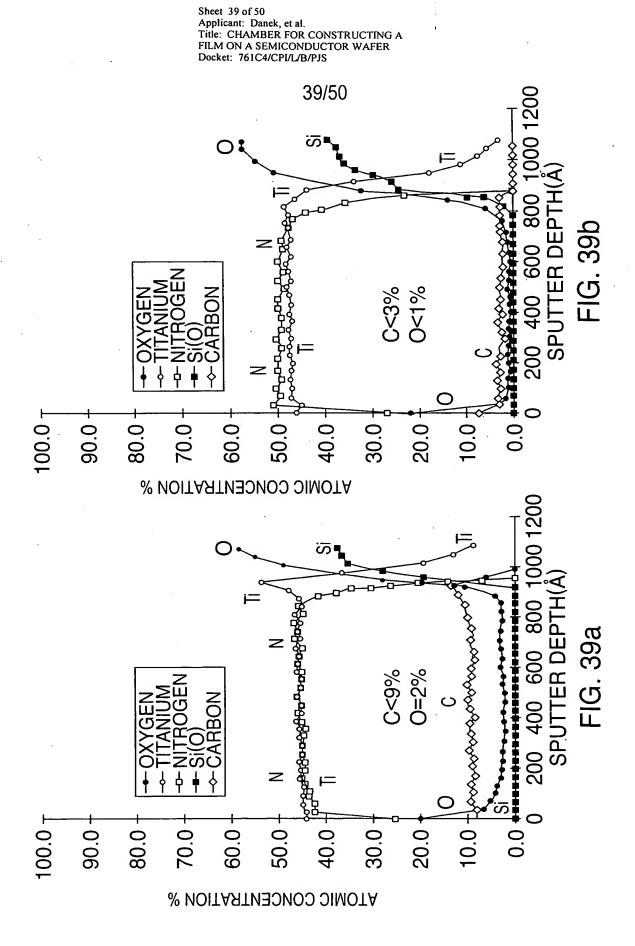
FIG. 38A

EFFECT OF PLASMA TIME AND FREQUENCY ON FILM RESISTIVITY

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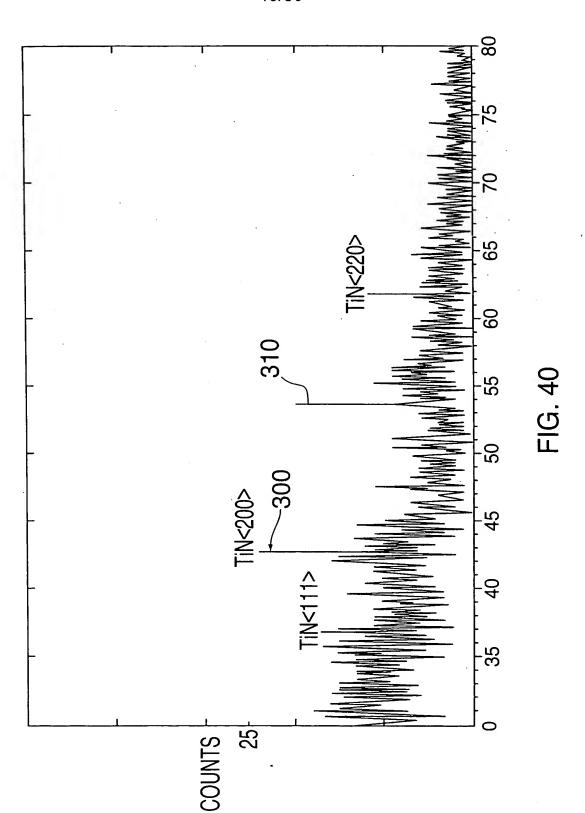


SATURATION OF PLASMA TREATMENT AT 50 Å INTERVAL

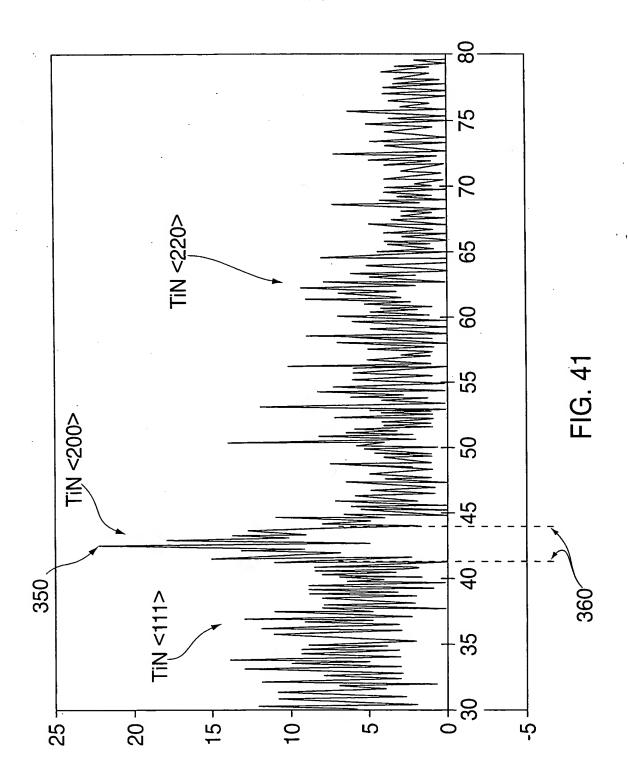


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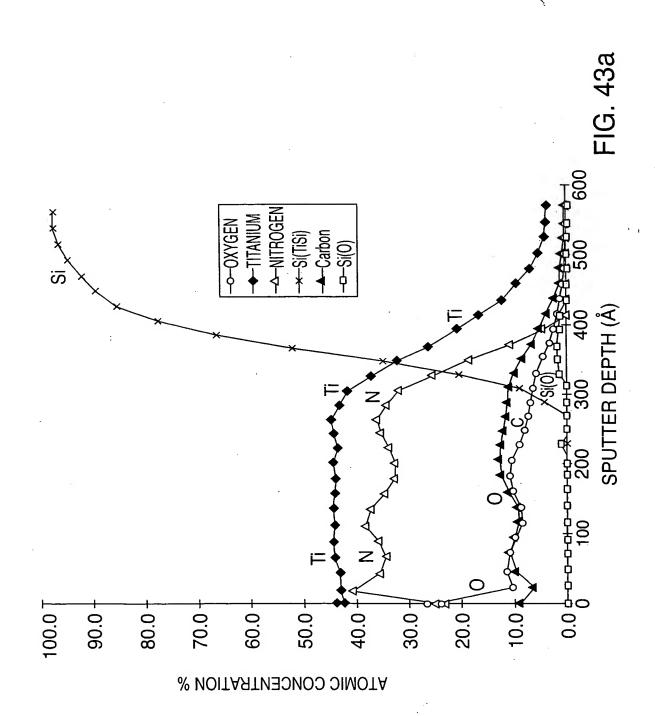


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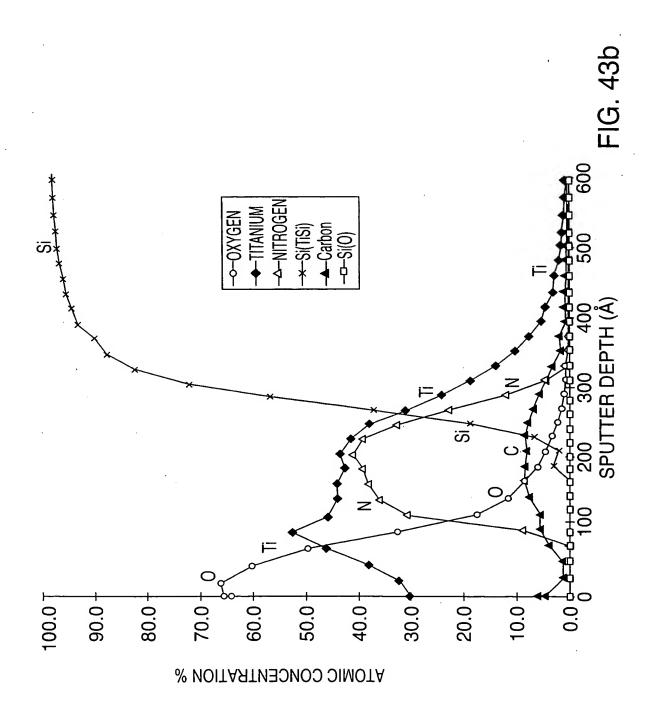
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	_		
2x100 RESISTIVITY (μ Ω -cm)	AGING @ 50 HOURS CONC	OXYGEN CONCENTRATION (%)	CARBON CONCENTRATION (%)
570 - 630	11 - 12	12	8
450-500	7 - 8	10.8	. 12
440-480	3-7	9.1	10.5
540-600	11 - 12	10.5	12.3



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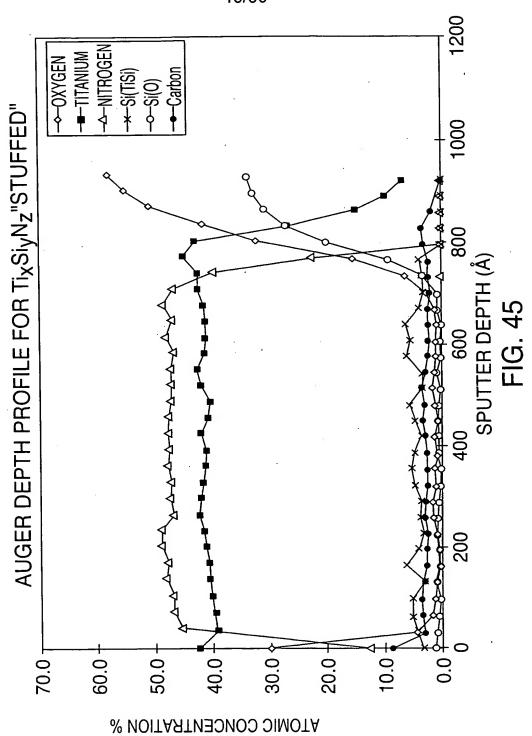
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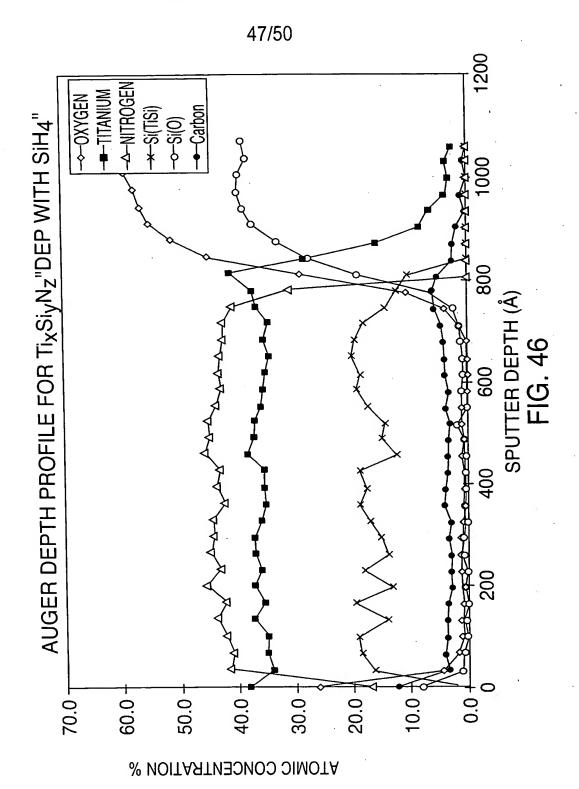
SUBSTRATE DEFECTS SEVERE SEVERE MINOR NONE SHEET RESISTANCE UNIFORMITY STANDARD DEVIATION 2.2% 2.0% 3.7% 2.7% SHEET RESISTANCE 410 **D**/SQ. 630 **\O**/SQ. 250 n/SQ. 235 **D**/SQ. 200 Å (20 SECONDS OXIDATION) 300 Å (20 SECONDS OXIDATION) 200 Å (NO OXIDATION) 300 Å (NO OXIDATION) FILM THICKNESS

CHARAC	CHARACTERIZATION OF STUFFING VERSUS DEPOSITION	F STUFFIN	G VERSUS DE	POSITION	
SAMPLE	RESISTIVITY $\mu\Omega$ -cm	00	COMPOSITION, ATOMIC PERCENT	ATOMIC PE	RCENT
·		TITANIUM (Ti)	NITROGEN (N)	SILICON (Si)	TITANIUM NITROGEN SILICON HYDROGEN (Ti) (N) (Si) (H)
	1				
SILICON STUFFED TIN	~520	35.2	52.8	ر د	7
DEPOSITED TISICN	~2400	25.3	49.7	15	10



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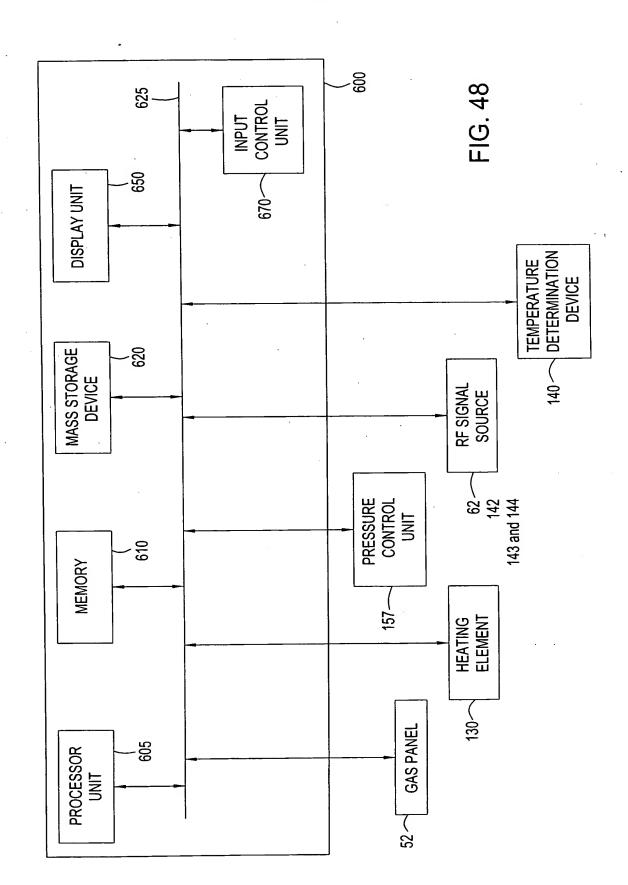


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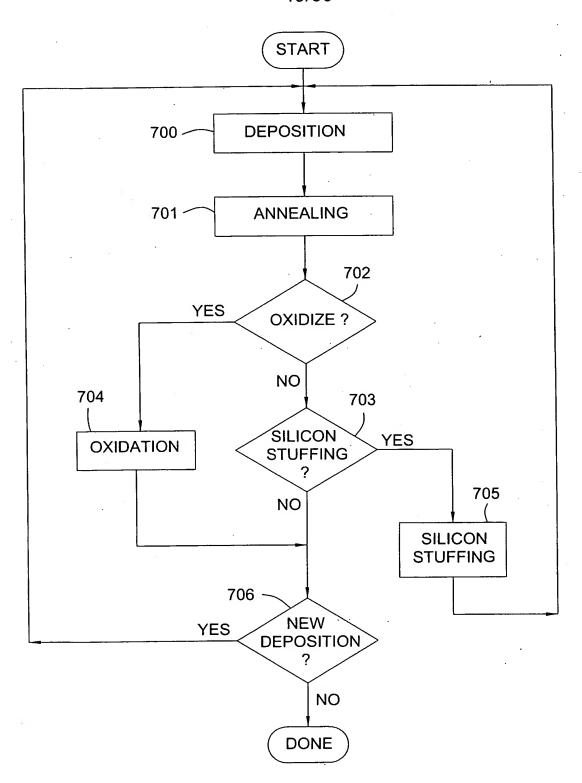


FIG. 49

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